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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/537,760
Filing Date: June 06, 2005
Appellant(s): ZHA ET AL.

Gregory Gerstenzang
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 10/6/10 appealing from the Office action mailed 5/19/10.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims list of 5/11/10, which were finally rejected.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the

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subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

2005/0006308	COTE	01-2005
US 2001/0047962	ZHA	12-2001
US 5482625	SHIMIZU	01-1996
US 5783083	HENSHAW	07-1998
US 2002/0189999	ESPENAN	12-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Applicant had elected the species represented by figure 2 (presented below) for prosecution in response to the restriction requirement.

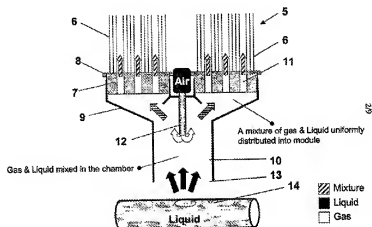
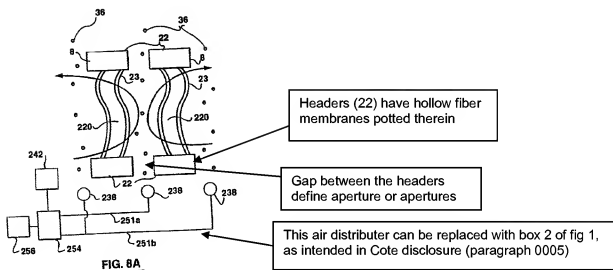
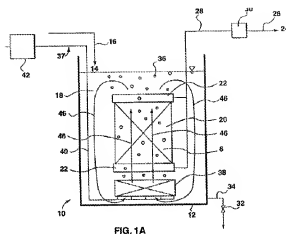
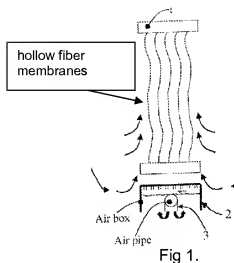


Figure 2.

1. **Claims 1- 3, 6, 9-14, 17,20-22, 35, 40-48, and 54-56 (all actively pending claims) are rejected under 35 U.S.C. 103(a) as being unpatentable over Cote et al (US 2005/0006308) in view of Zha et al (US 2001/0047962)**

The Cote et al reference has an effective filing date of March 23, 2001 which is the filing date of the provisional application. The subject matter relied on to support this rejection is disclosed in the provisional application.

Rejection of Claim 1:



Cote teaches with respect to the figures 1, 1A and 8A (which appear as schematic figures) copied herein, a membrane filtration apparatus comprising a *plurality of membrane filtration modules* (see the combination of figures 1, 1A and 8A, explained in more detail below), each module comprising plurality of hollow fiber membranes in an array (23), encasing support structure (not taught by the Cote reference), lower end mounted in *lower pots supported in headers (22)* (header, as defined by applicant's

disclosure copied below with respect to modules and plurality of apertures). (Also Cote, fig 1A shows linking pipes for permeate withdrawn, which form part of the structural support or header), upper ends mounted in upper pots and supported by upper header (22); upper header configured to provide for permeate withdrawal from the upper ends of the membranes (28, fig 1A).

Regarding a *plurality of distribution apertures defined in said lower pot ... configured to distribute scrubbing fluid into the modules and along a surface ... of said membranes*¹ [underline for emphasis]: for interpreting this limitation, as well as the "plurality of modules" and "headers", Appellant's disclosure of the modules with distribution apertures as in pages 7 and 8 (copied herein below) of the disclosure along with fig 2 is used.

20 In yet a further alternative embodiment, a plurality of headers without apertures
may be used, provided these are spaced such that the gaps between the headers define an
aperture or apertures for the fluid and gas bubbles to scrub the membranes.

[underline by

Examiner for emphasis]

 In an example of this alternative aspect, the membrane module includes a plurality
of porous membranes extending in an array and potted in headers. Said modules are
25 mounted in such a way that said headers are configured to provide a number of

¹ Claim 12 recites this limitation as "said lower pots being configured to provide a number of distribution apertures therein". Claim 35 recites "means for flowing said cleaning mixture along a surface of said membranes to dislodge fouling materials therefrom". Claims 41 has "said potting heads are configured to provide a number of distribution apertures therebetween". Claim 35 appears to be the broadest claim.

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distribution apertures therebetween for distributing a fluid into said modules and along surfaces of said membranes, a chamber having one open end and another end in fluid communication with said distribution apertures for distributing said fluid to said distribution apertures.

- 5 Particularly in the case of flat-sheet membranes or curtain-like hollow fiber modules, where there are no apertures are in the lower header, apertures or passages for fluid and gas bubbles can be formed by mounting modules in close proximity leaving a gap or gaps between modules.

With respect to fig 8A of Cote Provisional, there are two modules (22/220) shown with a gap therebetween. This gap forms a distribution aperture. An actual apparatus represented by Fig 1A by this design of Cote can have several of these modules in parallel arrangement (one behind the other when looking at Fig 1A) , and several of such apertures (or gaps) between them.

A single manifold coupled to the lower header of each of said plurality of membrane filtration modules:

Appellant's specification at page 4, lines 17-24 describes the shape of the manifold enclosing the headers, which is described as any, including square or rectangular. The shape of the manifold in Appellant's Figure 2 (part of 9) also can be easily interpreted as rectangular or square.

The manifold is the upper part of box 2 (5: fig 2 of Cote) with the air holes (see the annotated lower end of Fig 1). A single chamber (within box 2) is positioned below the header(s), and is attached to the header(s) (paragraph 0012 of Cote teaches that the air box is attached to the modules or headers; thus further defining the distribution

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apertures as claimed); this chamber has an open base end (bottom) in communication with the source liquid (the device of Cote is a submerged membrane device, or it can be submerged in a water), the second end of the box is in communication with the distribution apertures,

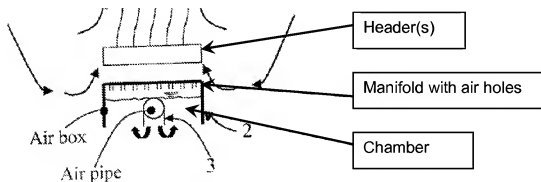


Figure 1

A single gas inlet (3) with downward flow direction the open base end, and the gas is fed from above through the manifold (air pipe directs air downward from above), the inlet is shown as centered under the module in Fig 1 and when the gas inlet design of Fig 1 is used in the other figures such as Fig 8A, it would be centered and between two modules, and releases gas at a point vertically below the modules,

The chamber (box 2) is configured to mix the gas with the liquid as the gas bubbles or sparges into the liquid to distribute the scrubbing fluid (air or air/water mixture) through the distribution apertures.

The Cote reference does not teach the membranes as *"encased in a support structure"*, which is not shown in applicant's elected embodiment, but assumed as a screen cage (20) as in Fig 6, [This limitation is present only in claim 1]

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Regarding the support structure, Zha teaches such a support structure for the purpose of protecting the membrane from damage due to excessive sway. See fig 1 and paragraph 0016 of Zha which has the screen cage (9). It would have been obvious to one of ordinary skill in the art at the time of invention to use this teaching of Zha in the teaching of Cote to protect the Cote membranes.

Claim Rejections as presented in the final action

Figure 1 of the provisional application is copied below (along with Figures 1, 3a and 3b of Zha).

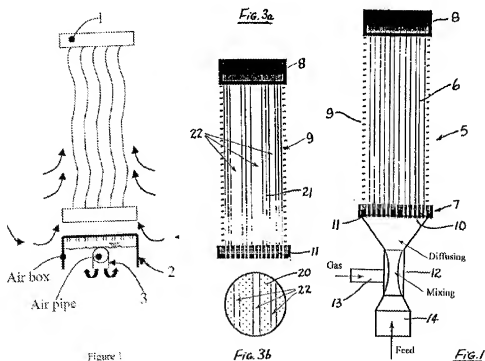


Figure 1 of Cote (Provisional), and Fig 1, 3a and 3b of Zha

Cote teaches a membrane filtration apparatus comprising plurality of filtration modules in arrays (see the figures in the reference and the provisional application: particularly, figures 1,2,1A, 6, 8A and 8B of the provisional), the modules have hollow fiber membranes in arrays (as seen in Fig 1); the membranes are encased in pottings connected by pipes; headers (potting) on upper and lower ends, permeate can be withdrawn from both top and bottom headers (as seen in Fig 1A). The modules comprise smaller bundles of membranes (220) potted (22) on both ends, the bundles separated by a small gap between them which act as aeration holes as can be seen in Fig 8A and B.

Air distribution header with plurality of apertures: aeration box 2 with apertures (5; Fig. 2). Air supply manifold (3) has an aperture which is facing downward. The air pipe 3 can be single manifold with a single gas inlet directing air in a downward direction serving a plurality of modules as claimed. Cote teaches that air holes 5 on box 2 may be sized to have box 2 empty of air during the lower air flow periods, which allow tank water to flow through the holes 5. The air box (2) is thus configured to mix gas and liquid, and deliver the scrubbing fluid (air and water mixture) through holes 5 and through the gaps between the membrane bundles (220 and 22, fig 8A,B). See paragraphs 0010-0018 of the provisional application. Paragraph 0012 teaches that the box 2 can be attached to the membrane assembly, thus making the top portion of the air chamber as the "manifold coupled to ... header" defined in the claims. The manifold in applicant's disclosure (Fig 2) is the top portion of the mixing chamber – see manifold 9 and chamber 10 in fig 2. The air nozzle (air inlet) is centered with respect to the

modules. The air nozzle is also between the modules. (see fig 1 above, as well as the figures 6).

Cote does not teach a support structure (such as the wire cage disclosed by the applicant). One could make an argument that Cote also does not teach that the air holes are in the potting of the lower header (even though the gaps between the bundles in Cote is structurally similar to the slots between the bundles in applicant's Fig 2, which for the air holes defined in the claims). However, such details are also well known, and also taught by Zha as shown infra, in rejection 2.

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teachings of Zha and Cote to arrive at applicant's invention as taught by Zha because of the advantages of the Cote air distribution system (see Cote Provisional at paragraph 0021: benefits), with its advantages of the cyclical low and high flow of air) with the Zha design providing improved air scrubbing and removal of accumulated solids at the potted ends without significant loss of packing density (see Zha, paragraphs 0012, 0055 and 0062) The membrane support system is also well known and is not a patentable difference. It would have been obvious to one of ordinary skill in the art at the time of invention to have the support system such as a cage as taught by Zha to prevent excessive lateral movements of the fibers that could lead to fiber damage, as taught by Zha (see paragraph 0014).

- 2. Claims 1- 3, 6, 9-14, 17,20-22, 35, 40-48, and 54-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zha et al (US 2001/0047962) in view of Shimizu, and further evidenced by Cote et al (US 2005/0006308).**

Rejection of Claim 1:

If Figures 1, 2,3,9, etc, Zha teaches a membrane filtration apparatus comprising a plurality of membrane filtration modules:

Figure 1 shows one module with plurality of holes in the lower header, but having more than one such module attached to a common manifold would be obvious to one of ordinary skill. (Note: mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*; *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960))

Fig 9 shows plurality of modules *as defined by appellant's disclosure at page 7, line 20 – page 8, line 8* (quoted above) with plurality of apertures as plurality of gaps between the headers.

If Figures 9 and 10 together are interpreted as a single module, then see paragraph 0059, "attachment to appropriate manifold (not shown)", which can lead to "plurality of modules" in a manifold. (And at least in claims 35 and 41, these apertures are defined as gaps between the potting heads or headers, and thus modules have a different definition as in pages 7 and 8 of the specification as quoted above).

The module has a plurality of membranes in an array, encased in a screen cage (9, 51), having lower ends mounted in lower pots (11, 48) and supported by a lower header (manifold not shown), upper ends mounted in an upper pot and supported by an upper header configured to remove permeate from the membranes (paragraph 0040), plurality of distribution apertures defined in the lower pot (10,52) for distributing

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scrubbing fluid along the membrane surface, a single manifold coupled to the lower header (12,13; 57),

Zha teaches a chamber (diffusing chamber; 55) below the header or module and connected to the manifold and arranged to promote upward flow of feed liquid from an open base (14; 57 also has open base) using a jetting gas inlet (paragraph 0009), but does not teach the gas inlet as introducing gas in a downward direction.

The teaching of **Cote** (Provisional) describing this chamber attached to the header and the gas manifold, with gas injected downward from a gas manifold above the gas inlet, is described above.

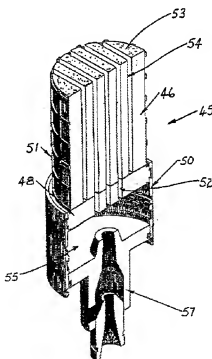
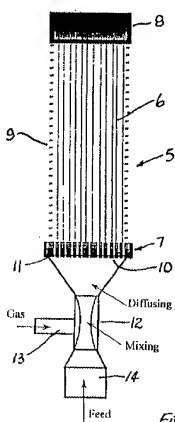
Shimizu also teaches downwardly facing air inlet in a submerged membrane system with plurality of flat membrane modules (similar to what is disclosed by Appellant at page 8, lines 5-8 quoted above). See the Shimizu figure copied hereinabove.

It would also have been obvious to one of ordinary skill in the art at the time of invention to use the teaching of Shimizu or Cote in the teaching of Zha to have a wider gas distribution from a short-distance injection point and prevent any swirl generated by an upward injection (Shimizu column 4 at line 60), and to have the advantages as taught by Cote (see under paragraph 0021 of Cote Provisional).

Claim Rejections as presented in final action:

Zha teaches the membrane module as claimed – see the figures, particularly, figures 1, 2 and 9. Hollow fiber membranes (6) are potted at both ends (7 and 8).

Perforations or slots in the lower potting or header (7) are clearly visible in both the figures 1 and 9. The opening sizes in the membrane potting heads are in the range as claimed (paragraph 0020). Deflector for the gas – see the jet assembly 57 described in paragraph 0061. Packing density as claimed – paragraph 0019. The lower header has a manifold with an open-ended mixing chamber beneath as claimed – see the figures. However, having more than one such module in one manifold would have been obvious to one of ordinary skill in the art to have one gas inlet device supplying more number of modules for an increased membrane capacity (Note: mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*; *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960))



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The gas source and the gas source being in the header, integral or among the porous membranes - see the figures 2,7, and 8 in the Zha reference - the structure of the gas source in these figures appear to be similar as in instant fig 2, except that they are upward. The gas injectors are described in paragraph 0009 of Zha as:

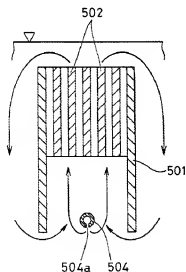
For further preference, the gas bubbles are entrained or injected into said liquid stream by means of devices which forcibly mix gas into a liquid flow to produce a mixture of liquid and bubbles, such devices including a jet, nozzle, ejector, eductor, injector or the like.

[underline by examiner]

This description of the gas/air injector does not limit the teaching of the reference to any particular structure, and includes a nozzle among others.

Having the air nozzle inverted (upside-down) is obvious over Shimizu, as shown infra.

Shimizu teaches a submerged flat membrane system having aeration from the bottom, with the air inlet directed downward – see the figure reproduced below.



Shimizu teaches (column 4, at line 60):

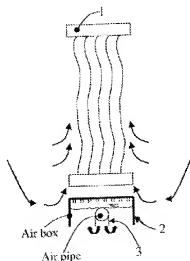
"This arrangement is advantageous in that because bubble of aeration gas spurted downward from the diffusing port rises without generating swirl even when a distance between the lower end of the membrane cartridges and the diffuser is short, such bubble is evenly supplied in the gaps between the membrane cartridges fast enough to prevent sludge from being adhered to the surface of the membrane."

It would have been obvious to one of ordinary skill in the art at the time of invention to combine this teaching of Shimizu in the teaching of Zha to have the air inlet set inside the chamber downward to have the advantages taught by Shimizu. Having an air line into the chamber to provide for the air outlet, and how to place the air line with respect to the header or the membranes would be obvious to one of ordinary skill, and could be designed based on convenience.

Such design of the inverted gas nozzles is also taught by Cote as flows:

Cote reference has a priority date backing to March 23, 2001 to the provisional application 60/278,007, a copy of which is provided in an 892.

Figure 1 of the provisional application is copied below.



Cote teaches a membrane filtration apparatus comprising plurality of filtration modules in an array (see the figures in the reference and the provisional application: particularly Fig 5,6,8A, 8B), the modules are encased in headers on upper and lower ends, permeate can be withdrawn from both top and bottom headers.

Air distribution header with plurality of apertures: aeration box 2 with apertures (5: Fig. 2). Air supply manifold (3) has an aperture which is facing downward as claimed. Such downward-facing submerged air nozzles have the advantage of (1) preventing water from entering the nozzle and filling the manifold during low or no air flow periods, and (2) it provides a wider upward air distribution and prevents shooting of air upward as is the case when the nozzle is facing upward. The down-ward facing air nozzle is a commonly known design.

It would have been obvious to one of ordinary skill in the art at the time of invention to combine the teaching of Cote with that of Zha to obtain the advantages (see Cote provisional at paragraph 0021) and use plurality of modules as taught by Cote in the teaching of Zha.

Having integral gas source to the header is also taught by Espenan US 2002/0189999 - see figures. Thus having gas source as "integral" to the header is not inventive, and is well known.

The "clover-type" is only a change in shape without any particular function or advantage, and is not patentable as shown in rejection 1 above.

The Argument that one would not replace the venture or jet of Zha with the air diffuser of Shimizu is not persuasive: Zha teaches a nozzle, injector, or a jet type air nozzles as well (see paragraphs 0009 and 0046 on top of page 4) which force gas into

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liquid (unlike the venturi, which pulls gas by creating a vacuum) and such nozzles of Zha could be inverted in the fluid flow path to obtain the same benefits taught by Shimizu, which includes better distribution of air as well as prevent the nozzle from clogging by the settling particles in water, particularly when the air flow is stopped).

In any case, the argument about no motivation to combine is not persuasive: motivations are clearly stated in the office action. More over, incorporating known elements in a combination is *prima facie* obvious.

3. Claims 1- 3, 6, 9-14, 17,20-22, 35, 40-48, and 54-56 are rejected under 35

U.S.C. 103(a) as being unpatentable over Zha and/or Cote in view of Shimizu as applied above, and further in view of Henshaw (US 5,783,083).

Some of the claims in the above list differ from the teaching of Cote and/or Zha in having plural modules arranged in *differently shaped* manifolds. Henshaw teaches plurality of submerged membrane modules arranged in manifolds to have enlarged capacity treatment systems. It would have been obvious to one of ordinary skill in the art at the time of invention to use the teaching of Henshaw in the teaching of Hein in combination with Zha for the purpose of having larger treatment systems/reactors as taught by Henshaw.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims

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are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thornton*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1- 22, 35, 40-48, 54-56 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over the pending claims of copending Application No. 11/025,418 in view of Shimizu. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the '418 application recite the limitations of the instant claims. Having the air inlet downward is not patentable as shown above in rejection 1.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

In response to the argument that applicant will file a TD when the application becomes in condition for allowance: the double-patenting rejection cannot be withdrawn until applicant clears the double patenting rejection by filing a TD or other wise.

(10) Response to Argument

Claims 1, 12, 35, 40 and 41 are independent, with varying breadth. Of these claim 1 is the most comprehensive. Claim 35 appears to be the broadest. Since the Appellant has not argued the claims individually, the Examiner assumes that the decision on appeal would be based on the broadest claim. However, separate detailed analysis of claim 1 with respect to the first two rejections is provided hereinabove for further clarity.

Appellant's arguments are addressed in the order presented in the brief.

A. Each of claims 1-3, 6, 9-14, 17, 20-22, 35, 40-48, and 54-56 is patentable over the asserted combinations of Cote '308 in view of Zha and Zha in view of Shimizu and allegedly further evidenced by Cote '308.

In response to the argument at page 7 of the brief:

The Cote Provisional and Shimizu are substantially cumulative with regard the features disclosed therein which are relied on by the Examiner in support of the above rejections. As such, the rejections over Cote '308 in view of Zha and over Zha in view of Shimizu as further evidenced by Cote '308 will be addressed together.

While some of the features of Cote and Shimizu provide cumulative evidence, the rejections (1) cote (provisional) in view of Zha, and (2) Zha in view of Shimizu with further evidence from Cote are two separate rejections and should be considered separately.

1. Cote '308 is not proper prior art.

Appellant makes the argument that Cote et al (US 2005/0006308) is not a proper prior art. This argument is not persuasive. The subject matter relied on to support the rejection is disclosed in the provisional application 60/278,007, which is made clear in the rejection of Claim 1 supra.

2. Neither Cote '308 and Zha, nor Zha and Shimizu allegedly further evidenced by Cote '308, are properly combinable *ab initio*.

i. One of ordinary skill in the art would have been dissuaded from making the asserted combinations of references.

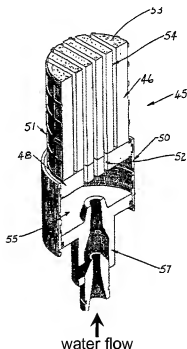
Contrary to the argument, the inverted nozzles or air holes in Cote and Shimizu do teach to overcome the deficiencies noted in the cited paragraphs of Zha, [0004], [0041], [0045], and [0046].)

The downwardly directing air holes would not be blocked by the settling of suspended solids, whether the air flow ceases or not, because of the fact that they are facing downward, whereas, any accidental stoppage of air or liquid flow would cause settling of solids in the upwardly oriented venturi tube, jet, nozzle, ejector, eductor or injector or the like as described in paragraph 0041 of Zha. Since the "venturi" of Zha is described as encompassing several different structures including a nozzle, it can include a simple hole in a pipe. See for example, Fig 9 of Zha, copied below. Figures 1 and 9 show modules submerged in a tank of water. The bottom of the chamber (14 or 57) is open so as to let the water into the nozzle, jet or venturi, and it is the air that is

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admitted through the nozzle that propels the water upward along with the air flow. The stoppage of water or air flow through the venturi would cause dirt to settle in the venture nozzle that could block air and water flow.

A downwardly directed nozzle, such as taught by Cote or Shimizu, would prevent this blockage.



Other arguments under this sub-heading are all directed at, or describe the difficulties associated with, bodily incorporation of Cote into Zha or Zha in to Cote or Zhimizu. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208

USPQ 871 (CCPA 1981). Replacing the jet, venturi or the nozzle of Zha with the Cote type inverted nozzle would be an easy task for one of ordinary skill, when looking at Zha Fig 3 (a and b) and Cote Fig 1.

Regarding KSR, the references are combinable if there is a reason for one of ordinary skill in the art to do so; and such reasons are provided in the rejection.

ii. The Examiner relies on conclusory statements without articulated reasoning in support of the assertion of the combinability of the cited references.

Contrary to the argument under this section, the Office Action provides ample reasons as to why one of ordinary skill in the art would consider combining the references. All the claimed elements in the claims are taught by the references. Applicant has failed to point out even a single element of the claim that either Zha or Cote does not teach. There is sufficient clarity provided in the rejection to show the teachings of the references with appropriate pictures and descriptions.

iii. The Examiner improperly relies on hindsight reasoning in support of the assertion of the combinability of the cited references.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a

reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In the instant situation, the structures claimed are well known in the art. The references provide substantially good motivation to combine the teachings of the references. Thus the hindsight argument is not persuasive.

3. Even if the asserted combinations of references were valid, the asserted combinations still fail to teach each and every element of the present claims.

The only discernable point from this section of the arguments is the allegation that the references in single or combination does not teach a plurality of membrane modules coupled to a single manifold. The "plurality of modules" as claimed, and as disclosed in pages 7 and 8, relevant paragraphs of which are copied hereinabove, is taught by Cote provisional as explained in the rejection. In addition, having plurality of modules in one module would be only replication of the one module installed in the manifold, which is not a patentable limitation. Duplication of parts: *St. Regis Paper Co. v. Bemis Co.*; *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960)

Argument that Cote provisional is not prior art is incorrect.

Each of the 'membranes' of Shimizu can be module according to the definition of the module in page 8 of Appellant's specification, lines 5-8. However, Shimizu is used for its teaching of the downwardly directed air nozzle.

The rest of the arguments in this section are not commensurate in scope with the claims. The claims require the air manifold to be coupled to the header, which is the

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case with all the references cited herein. "Coupled to the header" does not mean that the manifold has to be within the header or running through the header. However, even if so, such modifications are not critical to the invention, and obvious to one of ordinary skill. The actual positioning of the manifold with respect to the header would be only a matter of convenience, and is not a patentable difference.

B. Each of claims 1-3, 6, 9-14, 17, 20-22, 35, 40-48, and 54-56 is patentable over the asserted combination of Zha and/or Cote '308 in view of Shimizu and Henshaw.

This additional rejection was provided to show that having a plurality of modules on a common manifold is known in the art and thus obvious to one of ordinary skill in the art. Henshaw teaches plurality of modules on a common manifold for relatively large systems (figures; column, lines 25-30). Henshaw also teaches differently shaped modules. It would be obvious to one of ordinary skill to have larger plants by having plurality of modules to increase the plant capacity as desired. Now, the claim only require a plurality of modules connected by one manifold and one chamber. This means, just two modules connected by a single manifold and chamber would read on the claims. Plural = more than one, two is more than one. It does not require that air supply to the entire assembly of Henshaw be through a single nozzle. And Henshaw is not used to show that such teaching is obvious; it is used only to show that having plurality of modules to increase plant capacity or having a larger plant is obvious. Thus the arguments are not commensurate in scope with the rejection.

Conclusion:

From the facts presented in the rejections, and the rationale for one of ordinary skill to combine the references as provided by the teachings of the references themselves, there is a strong prima facie case of obviousness. Appellant has not presented any evidence to overcome this prima facie case of obviousness.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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